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Production Planning for Animal Food Industry under Demand Uncertainty

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Abstract : This research investigates the distribution of food demand for animal food and the optimum amount of that food production at minimum cost. The data consist of customer purchase orders for the food of laying hens, price of food for laying hens, cost per unit for the food inventory, cost related to food of laying hens in which the food is out of stock, such as fine, overtime, urgent purchase for material. They were collected from January, 1990 to December, 2013 from a factory in Nakhonratchasima province. The collected data are analyzed in order to explore the distribution of the monthly food demand for the laying hens and to see the rate of inventory per unit. The results are used in a stochastic linear programming model for aggregate planning in which the optimum production or minimum cost could be obtained. Programming algorithms in MATLAB and tools in Linprog software are used to get the solution. The distribution of the food demand for laying hens and the random numbers are used in the model. The study shows that the distribution of monthly food demand for laying has a normal distribution, the monthly average amount (unit: 30 kg) of production from January to December. The minimum total cost average for 12 months is Baht 62,329,181.77. Therefore, the production planning can reduce the cost by 14.64% from real cost.

Keywords : animal food, stochastic linear programming, aggregate planning, production planning, demand uncertainty
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